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partial longitudinal septum. The spore is often composed of only six divisions or cells, loosely attached to each other, the four middle ones placed in a subquadrate manner, with a single nearly globose cell at each end. These different cells are so slightly attached to each other that they easily separate and the sporidium breaks up like a crumbling raspberry.

On the dead stems of some species of *Cirsium*.

SPHÆRIA (ANTHOSTOMELLA) PHOLIDIGENA.—Perithecia subcuticular, erumpent, hemispheric, rough (.33-.5<sup>mm</sup>); ostiolum slightly prominent, with a rather large aperture; asci linear, 114 x 7 $\mu$ ; paraphyses abundant; sporidia uniseriate, narrow, elliptical, continuously brown, 7-10 x 5-6 $\mu$ . Some of the perithecia contain stylospores, which are much like the ascospores, but a little shorter. This differs from *Amphisphaeria conorum*, Fckl., only in its smaller sporidia and differently shaped stylospores, and may, perhaps, be more properly considered as a mere variety of that species.

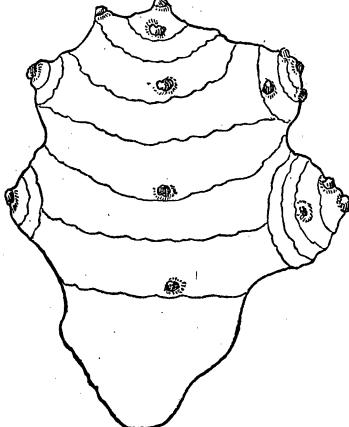
On cones of red pine. On the back of the scales and mostly covered by the overlapping point of the next scale below.

**Morphology in the Tuber of Jerusalem Artichoke.**—Picking up, in my garden, a tuber of Jerusalem artichoke which had been thrown out on the surface by recent spading, I was attracted by the prominence of the buds, and the distinct markings on the tuber, showing the position of the buds, leaves and branches in the order of their phyllotaxis. The accompanying sketch, which I made at the time, will exhibit this arrangement.

On the growing stem, the artichoke (*Helianthus tuberosus*) has the leaves opposite during the early part of its growth, the upper leaves gradually becoming alternate. In this tuber, or underground stem, the opposite-leaved arrangement is plainly visible. On the right side are two arrested branches from the axils of suppressed leaves, corresponding to two others on the left side which are not so fully developed. The alternate buds, occupying the front face (and to which there are others corresponding on the opposite face) seem not to have developed into branches, but remain only as buds. The wavy lines of exfoliating membrane or skin seem morphologically to belong to the leaf-system,

and mark the division of the nodes, corresponding in this with the ridge formed by the expansion and adnation of the bases of the opposite leaves as seen in the stem above ground. The internodal spaces are very much contracted, and their wavy, undulating course is due to

NOTE.—*Valsa didymospora*, described on p. 98, Vol. ix., of the BULLETIN, proves to be only an imperfectly developed state of *Valsa subcuticularis*, C. & E.



the irregular cell-growth in the different portions of the tuber. I have not been able to trace the leaf-arrangement from positions of the buds, either in the Irish or sweet potato (both underground stems) so well marked, as in this of the artichoke, probably due to greater irregularity in cell-growth of these tubers. This of the artichoke offers a fine illustration of the underground tuber following the character of the growth above ground.

Aiken, S. C.

H. W. RAVENEL.

**Notes on New England Marine Algæ. II.**—*Calothrix parasitica*, Thuret.—This species, previously reported at Wood's Hall, Mass., was very abundant last September at Cottage City, completely covering the *Nemalion multifidum* growing at low water-mark between the Oak Bluffs and the Camp Meeting landings. The natural color of the *Nemalion* was entirely lost, giving place to a very dark bronze-green, turning almost black in drying. This species also occurs at Marblehead, but quite sparingly; the plants are so scattered through the *Nemalion* as to be observable only under the microscope, not with the naked eye. I have also found what appears to be the same species growing on plants of *Batrachospermum vagum*, collected in fresh water at Billerica, Mass., by Mr. Edwin Faxon.

*Codiolum longipes*, Foslie.—In July, 1881, I found at Peak's Island, Portland Harbor, Maine, a form of *Codiolum*, differing considerably from the typical *C. gregarium*, A. Br., the only species recorded in America. The unicellular fronds in the Portland plant are longer and slenderer, the stipe longer in proportion to the "clava." Dr. F. R. Kjellman, of Upsala, Sweden, kindly examined a specimen, and reported it identical with *C. longipes*, a species founded on a plant recently discovered in Norway, and described and figured in Christiania Videnskabs-Selskabs Forhandlinger, 1881, No. 14. Several species of *Codiolum* have been described, but, as the development is little known, some of them may be merely stages of growth of others. My specimens appeared to be entirely in a vegetative condition, showing no indication of the formation of spores. The plant grew on boulders at about half tide, and was not mixed with any other alga. *Ulothrix isogona* grew in the vicinity, but in distinct patches, and generally not on the same rock. When wet, the two were hardly distinguishable by the naked eye, but, when dry, the *Codiolum* showed a curious mottled appearance, the tufts falling apart so that the transparent stipes showed in minute white dots among the green of the upper parts of the cells.

*Chorda tomentosa*, Aresch.—Though not recorded, this species has probably been collected in this country, but confounded with *C. filum*, the spring state of which it considerably resembles. It is, however, shorter and stouter, and has longer and denser hairs, which continue till after the fruit is formed, in May and June. The hairs of *C. filum* fall off in the spring, while the fruit is not formed until August. The sporangia of *C. tomentosa* are about double the length of those of *C. filum*, and are cylindrical rather than ovate. The former are figured in Areschoug's *Observationes Phycologicæ*, Part iii., Tab. ii., Fig. 1; the latter in Farlow's *Manual of the New Eng-*